

Applicant(s): Sung-bae Park, *et al.*

Serial No.: 09/924,787

REMARKS

Claims 2 and 3 are objected to because of certain informalities. The claims are amended such that it is believed that the objections are overcome. Reconsideration of the objections is requested.

Claims 1 through 6 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite. The language pointed out by the Examiner has been amended such that it is believed that the rejections are overcome. Accordingly, reconsideration of the rejections is requested.

Claims 1 and 4 are rejected under 35 U.S.C. § 103(a) as being obvious over Applicant's Prior Art Drawings in view of Rutten, *et al.* (U.S. Patent No. 5,889,293). Claim 2 is rejected under 35 U.S.C. § 103(a) as being obvious over Applicant's Prior Art Drawings in view of Rutten, *et al.* and Adan, *et al.* (U.S. Patent No. 5,841,170). Claims 3 is rejected under 35 U.S.C. § 103(a) as being obvious over Applicant's Prior Art Drawings in view of Rutten, *et al.* and Hashimoto, *et al.* (U.S. Patent No. 5,475,257). Claim 5 is rejected under 35 U.S.C. § 103(a) as being obvious over Applicant's Prior Art Drawings in view of Rutten, *et al.* and Lynch, *et al.* (U.S. Patent No. 4,646,123). Claim 6 is rejected under 35 U.S.C. § 103(a) as being obvious over Applicant's Prior Art Drawings in view of Rutten, *et al.*, Lynch, *et al.* and Abiko, *et al.* (U.S. Patent No. 6,051,472). In view of the amendments to the claims and the following remarks, the rejections are respectfully traversed, and reconsideration of the rejections is requested.

The applicants' invention is directed to a silicon-on-insulator (SOI) MOSFET. The MOSFET includes a substrate, a buried oxide layer formed on the substrate, a body formed on the buried oxide layer, wherein the body is an active region of a transistor. A gate oxide layer is formed on the body, and a gate is formed on a gate oxide layer. An isolation region is formed adjacent to and at least partially surrounding the body. A body contact supplies power to the body. The body contact is formed by forming a trench that perforates the isolation region, the body and the buried oxide layer and filling the trench with a conductive material so that the body is electrically connected to the semiconductor substrate.

The claims have been amended to more clearly specify the structure of the invention.

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Specifically, the claims are amended to recite the isolation region being adjacent to and at least partially surrounding the body. It is believed that the body contact of the claimed invention perforating the isolation region, the body and the buried oxide layer is distinguished from the cited prior art.

Rutten, *et al.* is cited as disclosing a trench filled with conductive material that perforates various layers. However, the trench of Rutten, *et al.* does not teach or suggest the body contact claimed by the applicants. Specifically, Rutten, *et al.* fails to teach or suggest the specific features of the device claimed by the applicants. For example, Rutten, *et al.* do not teach or suggest the applicants' claimed body being an active region of a transistor. Accordingly, there is no teaching or suggestion of the trench of Rutten, *et al.* perforating the active region of a transistor, an isolation region that is adjacent to and at least partially surrounds the active region of a transistor and a buried oxide layer such that the body, that is, the active region of a transistor, is electrically connected to the device substrate.

The trench of Rutten, *et al.* penetrates various layers of the device. There is some suggestion in Rutten, *et al.* of device regions. For example, regions 24 and 25 shown in Figure 5 of Rutten, *et al.* are suggested to be subjected to source/drain implants. However, these regions are isolated from the electrical interconnect 26 by insulator 27. Other embodiments in Rutten, *et al.* show similar structures. Accordingly, even if Rutten, *et al.* were construed to disclose active regions of transistors, the regions are isolated from the electrical interconnect, i.e. trench, instead of being connected to the body contact, as claimed by the applicants.

Accordingly, Rutten, *et al.* fails to teach or suggest the invention set forth in the amended claims. The applicants' Prior Art Drawings also do not teach or suggest the body contact set forth in the amended claims. Accordingly, the combination of the Applicant's Prior Art Drawings and Rutten, *et al.* do not provide teaching or suggestion of the invention set forth in the amended claims. Therefore, reconsideration of the rejections of claims 1 and 4 under 35 U.S.C. § 103(a) based on the Applicant's Prior Art Drawings and Rutten, *et al.* is respectfully requested.

With regard to claim 2, Adan, *et al.* also fails to teach or suggest the body contact set forth in the amended claims. Accordingly, the combination of the Applicant's Prior Art Drawings, Rutten *et al.* and Adan, *et al.* fails to teach or suggest the inventions set forth in the amended claims. Accordingly, reconsideration of the rejection of claim 2 under 35 U.S.C. §

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103(a) is respectfully requested.

With regard to claim 3, Hashimoto, *et al.* also fails to teach or suggest the body contact set forth in the amended claims. Accordingly, reconsideration of the rejection of claim 3 under 35 U.S.C. § 103(a) is respectfully requested.

With regard to claim 5, Lynch, *et al.* also fails to teach or suggest the body contact set forth in the amended claims. Accordingly, reconsideration of the rejection of claim 5 under 35 U.S.C. § 103(a) is respectfully requested.

With regard to claim 6, Lynch, *et al.* and Abiko, *et al.* fail to teach or suggest the body contact set forth in the amended claims. Accordingly, reconsideration of the rejection of claim 6 under 35 U.S.C. § 103(a) is respectfully requested.

Attached hereto is a marked-up version of the changes made to the application by the current Amendment. The attached pages are captioned "Version with Markings to Show Changes Made."

In view of the foregoing remarks, it is believed that all claims pending in the application are in condition for allowance, and such allowance is respectfully solicited. If a telephone conference will expedite prosecution of the application, the Examiner is invited to telephone the undersigned.

Respectfully submitted,

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Version with Markings to Show Changes Made

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In the Claims

Claims 1-3 have been amended as follows:

1. (Amended) A silicon-on-insulator metal oxide semiconductor field effect transistor (SOI MOSFET) comprising:
 - a semiconductor substrate;
 - a buried oxide layer formed on the semiconductor substrate;
 - a body on the buried oxide layer, the body being an active region of a transistor;
 - a gate oxide layer formed on the body;
 - a gate formed on the gate oxide layer; [and]
 - an isolation region adjacent to and at least partially surrounding the body; and
 - a body contact supplying power to the body,

wherein the body contact is formed by forming a trench that perforates the [perforating an] isolation region, the body, and the buried oxide layer and filling the trench with a conductive material so that the body is electrically connected to the semiconductor substrate.
2. (Amended) The SOI MOSFET of claim 1, wherein the gate is formed of at least one material selected from the group consisting of metal and polysilicon.
3. (Amended) The SOI MOSFET of claim 1, wherein the conductive material is formed of one material selected from the group consisting of a metal layer, a tungsten layer, a silicon epitaxial layer, and a combination layer of at least two of a metal layer, a tungsten layer and a silicon epitaxial layer.